**Title:** The Hydro Times

**Content Area:** Science

**Grade Level:** 8th Grade

**Time:** Three (3) 45 minute class periods

**Standards:**

*Performance Indicator 2.1j* - Water circulates through the atmosphere, lithosphere, and hydrosphere in what is known as the water cycle.

*Common Core 8*.*W.4* – Produce clear and coherent writing in which the development, organization and style are appropriate to task, purpose and audience.

**Lesson Objectives:**

1. The student will be able to explain and simulate the phases of the Water Cycle.
2. The student will be able to identify and analyze sources of water pollution.
3. The student will be able to explain the effects of water pollution on ecosystems.

**Procedure:**

1. Anticipatory Set (5 minute free write w/ 10 minute share-out)
   1. Writing Prompt:
      1. When you hear the word *water*, what comes to mind? Your goal should be to write for 5 minutes and/or one page
   2. Allow time for group share-outs and full class share-outs
2. Water Cycle Skits – *(Two 45 minute class periods)*
   1. Each group (between 4-6 students) will be asked to research what occurs during each phase of the water cycle. Students will be asked to use [BrainPop – Water Cycle](http://www.brainpop.com/science/earthsystem/watercycle/preview.weml) to complete their research. The explanations should be written in their notebook.
   2. Students will be asked to create a skit that demonstrates each phase of the water cycle (Precipitation, Collection, Evaporation and Condensation). Students may use props, words and actions to explain what they learned.
   3. Groups will perform their skits for the class.
   4. The teacher and students will discuss similarities and differences between each skit. The teacher should guide students to identify differences, such as sources of water.
3. Aquifer Model – *(One 45 minute class period)*
   1. Beforehand, the teacher should make an Aquifer Model using the EPA’s [*Build Your Own Aquifer*](http://www.epa.gov/safewater/kids/flash/flash_aquifer.html)guidelines.
      1. The aquifer model includes areas to represent land, a lake, rock and groundwater.
   2. Ask students to brainstorm ways that water can become polluted. Have a student write answers on the SmartBoard or chalkboard.
   3. Ask students where they receive their drinking water. The teacher should guide the students to identify their water source can come from rivers, lakes or groundwater.
   4. Use the Aquifer Model to explain how water can be piped from under the Earth to someone’s home.
   5. Use a spray bottle (as directed in the *Build Your Own Aquifer* article) to represent precipitation. Where does the water go?
   6. What happens if a farmer places chemicals or pesticides on their crops, and then it rains? Place brown sprinkles or chocolate flakes on the ground, and use the spray bottle again. Have students observe what occurs.
   7. In their notebooks, students should write what they observed before and after pesticides were introduced to the fields. They should also explain how this might cause pollutants to enter drinking water, and some possible ideas to ensure safe drinking water for all.
4. Hydro Times Work Days *(Four 45 minute class periods)*
   1. Students should receive a copy of the *Hydro Times* document on the first day of the unit. They should be able to understand the components of the project, and aware of the deadlines set by the teacher.
   2. The teacher should embed the lessons identified above throughout the student workdays. A sample schedule to follow:
      1. Day 1 – Pass out *Hydro Times* Document and Begin Skits
      2. Day 2 – Rehearse and Perform Skits
      3. Day 3 – Begin researching and brainstorming water cycle news articles
      4. Day 4 – Write water cycle news articles
      5. Day 5 – Introduce water pollution and Aquifer Model
      6. Day 6 – Research and Brainstorm water pollution news
      7. Day 7 & 8 – Write news articles
      8. Day 9 – Small Group Presentations

**Assessment:**

*See below*

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**The Hydro Times**

**Background:** Water is an amazing and important component of the Earth. It affects weather, climate, temperature, population centers, and transportation routes. Just imagine going through your day without water. It would be pretty difficult, right? A water molecule also has a very interesting life. Its journey can take it to many places, like the ocean, rivers, and the sky and even underneath the ground, too. But, with any journey, a water molecule can run into danger such as contaminants and pollution.

**Task:** Develop a 4-page newspaper titled *The Hydro Times* that includes 4-6 news stories, Op-Ed articles, and/or “Dear Abby” writings that highlight the phases of the water cycle, sources of water, and causes of contaminants or pollution.

**Things to Consider:**

* Water Cycle Phases *(Condensation, Precipitation, Collection, Evaporation*)
* Sources of Water *(Groundwater, Oceans, Rivers, Lakes)*
* Sources of Pollution *(What might concern a water molecule?)*

**Rubric:**

|  |  |  |  |
| --- | --- | --- | --- |
| OUTCOME | NY CRITERIA | MS CRITERIA | ES CRITERIA |
| *Explain what occurs to water molecules during the Water Cycle Phases* | I am not able to explain what occurs during the water cycle OR I have not included each phase | I can explain what occurs in each phase of the water cycle  \_\_ Precipitation \_\_Collection  \_\_ Evaporation \_\_Condensation | I can articulate what occurs during each water cycle phase in a creative, original manner that embeds scientific vocabulary and my own language |
| *Explain how humans influence and impact their environment* | I am not able to correctly identify and explain a source of water pollution and its effects | I have included at least *one* story that correctly identifies and explains a source of water pollution and its effects  \_\_ Fracking \_\_ Factories  \_\_ Pesticides \_\_ Other | MS Criteria **AND** I can articulate my thoughts by using scientific language and my own language |
| *Communicate scientific information and ideas clearly and effectively, while adjusting to different audiences and purposes* | I am not able to provide or develop my thoughts or evidence to explain my understanding **OR** I am not able to include correct spelling, grammar and punctuation | I have used the TIED format while writing **OR** has *introduced* the *topic*, and provided *evidence* that explains and *develops* their writing **AND** includes correct spelling, grammar and punctuation | I can articulate my thoughts and ideas in new and innovative ways while using vocabulary, correct grammar, spelling and punctuation. |

**Lesson Reflection:**

This lesson I developed teaches students the influence that humans can have on the environment. Students often have difficulty understanding that they are part of an ecosystem, and what they do can affect other species and themselves. During the nine days, students will be reviewing the water cycle, discussing what occurs when contaminants enter a water source, and creating a newspaper from the perspective of a water molecule. Students will be accessing prior knowledge, using technology and inquiry to gain new understandings, and synthesizing or transferring their understandings into several news articles.

**Danielson Framework:**

*Competency 1e: Designing Coherent Instruction*

*Competency 3c: Engaging students in learning*.